



CASE REPORT

Y. Watanabe • T. Matsushita

Salvage of a failed valgus osteotomy for non-union of an unstable pertrochanteric fracture

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Abstract Salvage of a failed valgus osteotomy for non-union of an unstable pertrochanteric fracture is reported. A valgus intertrochanteric osteotomy is performed for a failed sliding hip screw fixation of an unstable pertrochanteric fracture at another institution. Four months following osteotomy, the fracture was still un-united with two distal screws of the hip plate broken and a coxa vara deformity. Reconstruction was performed with a nine-hole 95° angle blade plate and cancellous bone graft, because the insufficient fixation of the distal fragment was considered to be the main reason for failure. The osteotomy was healed at six months post-surgery and the patient reported complete resolution of symptoms. Intertrochanteric valgus osteotomy is an effective procedure for mal-union and non-union of pertrochanteric fracture but stable fixation is required for a good result. The blade of the angle plate offers good purchase of the proximal fragment and secures it under rotational and bending stresses. We recommend that distal fragments should be fixed with at least seven cortices for this type of osteotomy.

Key words Valgus intertrochanteric osteotomy • Mal-union • Hip fracture • Complications

Introduction

Varus mal-union and non-union is the most frequent complication following treatment of an unstable intertrochanteric fracture [1, 2]. Varus deformity results in limb shortening, gluteal muscle imbalance, limp and overloading of the knee joint and lumbar spine [1].

Valgus intertrochanteric osteotomy is useful for reconstruction of varus deformity after such fractures because it restores limb length and the biomechanical lever arms across the hip joint. However it is technically demanding and sometimes fails to maintain the correction.

In this case report, we present the salvage of a failed valgus intertrochanteric osteotomy for mal- and non-union after a comminuted intertrochanteric femur fracture.

Case report

A 25-year-old male patient suffered a comminuted fracture of the left proximal femur (Fig. 1) as a consequence of a motor-cycle accident for which open reduction and internal fixation with a sliding hip screw was performed at another institution.



Fig. 1 AP view radiogram at injury (a) and after open reduction and internal fixation with a sliding hip screw (b)

Y. Watanabe (✉) • T. Matsushita
Department of Orthopaedic Surgery
Teikyo University School of Medicine
2-11-1 Kaga, Itabashi-ku, Tokyo 173-8605, Japan
e-mail: fracture@zad.att.ne.jp

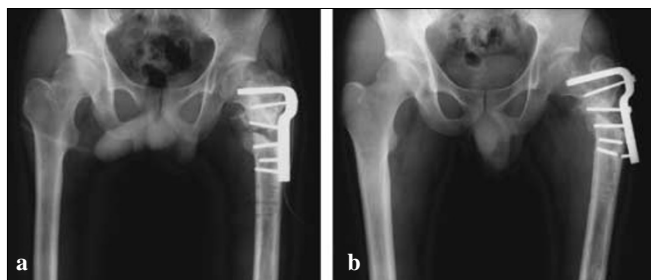


Fig. 2 AP view radiogram after intertrochanteric valgus osteotomy (a) and failure of fixation (b)

At 11 months no signs of bony union were present and varus deformity and a 3-cm shortening of the involved leg had developed. A valgus intertrochanteric osteotomy was then performed using a 90° double angle hip plate with corticocancellous bone graft (Fig. 2) at a different institution. Four months later the patient presented with a complaint of left thigh pain and limping at our outpatient clinic. At the time of initial presentation, radiographs revealed the fracture was still un-united with two distal screws of the hip plate broken and a coxa vara deformity (Fig. 2).

Operative procedures and technique

Reconstruction was performed with a nine-hole 95° angle blade plate and cancellous bone graft. The patient was placed in a lateral decubitus position; through a lateral approach, the hip plate and the screws were removed, and the lateral aspect of femur and the non-union site were exposed. At the same time, autogenous bone for graft was harvested from the ipsilateral anterior iliac crest. The fracture site was found to be grossly unstable under the stress of abduction and adduction by manual testing. Fibrous tissue between fracture ends was removed by curettage, and a 60-mm length angle blade plate inserted into the original window for the previous hip plate supplemented with a 60-mm cancellous screw in order to secure the proximal



Fig. 3 Six months following reconstruction of failed intertrochanteric valgus osteotomy. AP view (a) and lateral view (b). Solid bony union is seen

fragment. Following this, the non-union was reduced and the distal segment fixed to the shaft of the angle blade plate through six screws (12 cortices). Finally, autogenous bone graft was packed around the fracture site. To prevent implant overloading, partial weight-bearing was not permitted until eight weeks following surgery.

Follow-up radiographs six months post-surgery revealed bony union of the fracture site and limb length discrepancy was measured and found to be within 5 mm (Fig. 3). At this time, the patient reported complete resolution of symptoms.

Discussion

Valgus intertrochanteric osteotomy with an angle compression plate is a commonly applied solution for varus malunion after intertrochanteric and pertrochanteric fractures [1–3]. In the present case, valgus intertrochanteric osteotomy had been performed for correction of varus deformity and for restoration of limb length discrepancy. Excellent results with valgus intertrochanteric osteotomy have been reported [1–3], but in this case the osteotomy was followed by loss of fixation. The failure of fixation at the first attempted reconstruction is likely to have been the result of insufficient fixation of the distal fragment. As seen in the radiographs, the proximal fragment had been sufficiently fixed with a blade and two screws (one cancellous and one cortical screw), but the distal fragment had been held by screws engaging only four or five cortices.

The blade of the angle blade plate offers good purchase of the proximal fragment and secures it under rotational and bending stresses. In addition, supplementary fixation with one cancellous screw helps. We chose a nine-hole 95° angle blade plate for salvage surgery of the failed osteotomy because the longer shaft of this plate would provide greater purchase and stability of the distal fragment. This was borne by the mobility of the patient recovering to the pre-injury level within three months following our treatment and the non-union radiologically healed at 10 months after surgery. We recommend that distal fragments should be fixed with at least seven cortices for this type of osteotomy.

Intertrochanteric valgus osteotomy is an effective procedure for malunion and non-union of pertrochanteric fracture but stable fixation is required for a good result.

References

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